Edgar J. Cyriax

The Importance of Early Massage in Fractures Near Joints.

FERD. ENGELBRECTSON, M. D.
CHICAGO

Reprint from
THE RAILWAY SURGICAL JOURNAL
March, 1908

ELS.EL BRECTJOU

WELLCOME INSTITUTE LIBRARY
Coll. welMOmec
Coll. pam
No. WE 168
1908
E58c

22501241153

LIBRARY
303550

THE IMPORTANCE OF EARLY MASSAGE IN FRACTURES NEAR JOINTS.*

FERD. ENGELBRECTSON, M. D., CHICAGO.

In an article on "Massage in Trauma," published in the RAILWAY SURGICAL JOURNAL (March, 1907), is indicated the technic, indications and contraindications of massage, in fractures, contusions, sprains and reduced luxations. I will supplement that article by a plea for early massage in fractures which involve function in nearby joints and illustrate the technic on a fracture near the anklejoint.

The rationality of early massage in all cases of fractures which affect future usefulness of joints will be more clearly understood if we bear in mind:

First—That the injured tissues are built up by the cells, of which the parts involved are composed, and must be repaired by these same cells.

Secondly—That cellular activity like the activity of any individual depends on the supply of oxygen, nutrition and the proper elimination of the products of metabolism.

Thirdly—That the cell depends for these ne-

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

cessities solely on the blood and lymph which, if not properly circulating will not adequately supply its need in this respect, and thus reduce its activity which rather needs to be increased under these conditions.

We must not forget, too, that the activity of any tissue or organ represents the sum total of the function of the cells composing that tissue or organ. We may take for granted that with the cell in a condition of asphyxia, marasmus and intoxication, in greater or less degree, due to retarded circulation, we can not expect a beneficial cellular action in fracture, or any other condition.

Pathologically, we have always present more or less inflammation, extravasation and effusion retarding circulation in all tissues directly involved and in those distal to the injured parts. Ordinarily smooth surfaces become covered by irritating deposits, agglutinate and form adhesions; fascias contract, due to irritating substances which are not carried away, strangulating muscles, vessels and nerves: The natural results being faulty function of muscles, tendons and ligaments of joints after the fracture is healed.

Repair depends on cellular activity, and without improved circulation it must necessarily be slow, and in the meantime the vicious adhesions grow stronger and the contractures increase in degree. It is a well established fact that massage does prevent stagnation, adhesion and contractures. This action is due to the

increased circulation and constantly repeated passive movement of the tissues.

In a fracture near the ankle, there is very often a rupture of the ligaments of the joint and a traumatic synovitis. If the circulation is not maintained properly, the capsule will become distended from intracapsular pressure, and if this is allowed to continue for any length of time, the interstices of the capsule are filled up by newly organized tissue and it has a tendency to remain enlarged permanently, thereby impairing strength and function. At least recovery is very tedious, even with massage if not started early.

In this connection, I wish to warn against using Bier's congestion treatment in sprains involving joints, I have seen this used in a sprain of the kneejoint, by means of an elastic bandage applied on the thigh for 3 hours every day tightly enough to arrest the venous and lymph current with the desired result of a passive congestion in the whole limb, and with this, a very marked distension of the capsule of the joint, which was not relieved by daily massage. The distension (of the capsule) became chronic due to newly formed tissue filling up the interstices. This prevented the normal contraction of the capsule after subsidence of the inflammation produced by the trauma, and leaving a saccular capsule almost irreducible by massage, or any other means, at best requiring a great many sittings and a long time to correct. If such treatment is desirable, massage

must be injurious, the different proceedings being most directly antagonistic. I am also opposed to the very old practice in surgery, which is to encourage patients suffering from a fracture of the leg, to walk, sometimes before the cast is taken off at any rate before the muscles of the leg can be voluntarily moved.

The only force maintaining the venous and lymph current in the leg, opposing gravity, worth considering, is muscular activity. If that is lacking and the leg is kept pendant, gravity prevents the lymph and venous blood from ascending. This produces a state of passive congestion which even daily massage cannot overcome until the muscles of the leg have regained their function, in the meantime delaying improvement if not doing actual injury particularly if the ankle is involved. It is true this congestion favors the emigration of white corpuscles but of what advantage is this when there is no infection present. I realize fully the importance to the patient of moving about after a long confinement in bed but the obnoxious effects of such confinement may easily be prevented or relieved by general massage in addition to the local treatment.

A limb in which the muscles are not in use should be elevated most of the time to prevent passive congestion, because passive congestion means asphyxia, marasmus and intoxication to the cellular elements. It is obvious that venous blood and lymph retained in a part will act as an impediment to free access of arterial blood

which thereby is directed to other parts offering less resistance.

The object of massage is, of course, to improve and maintain the circulation in the highest possible degree. This is the rational stimulation for the cells to promote the increased activity which is required to repair the damage of the trauma. The immobilization of muscles, whose motion under normal conditions insure a good circulation, produces the necessity of some other means to take their place in this respect. And, barring contra-indications, massage is the only means to be considered under these circumstances.

A Colles' fracture will show the best results if treated as follows: A well padded pistol-shaped splint is applied leaving the thumb and all the phalanges free, patient being instructed to constantly flex and extend his digits. This splint is left on, not more than 7 days, then removed every day, massage and passive movement applied and the splint replaced. The splint is removed entirely after three or four weeks, and after this time there is very little to correct in the way of function. I have yet to see untoward results from this treatment.

In fracture of the leg near the ankle, the massage should commence as soon as the leg can be handled without disturbing the apposition, which is from 8 to 14 days.

The thigh is stimulated by stroking, kneading beating and passive motion of the hipjoint. After this, the cast is carefully removed, the leg

is placed so as not to disturb the apposition, then carefully manipulated commencing proximally, gradually advancing toward the injury with alternate compressions and relaxations of the soft tissues with the hand, at first very superficially, later more deeply, carefully avoiding all movement of the fragments which are controlled by keeping one hand constantly over the place of injury so as to detect any movement. All irritation must be carefully avoided and the area directly around the fracture is not manipulated until a more solid union is accomplished.

These manipulations are kept up 15 to 30 minutes or until the tissues present to touch a uniform resilience and improved cutaneous activity evidenced by a perceptibly raised moist heat in the region worked upon. The cast is replaced and the treatment is repeated as often as needed. On account of the difficulty of removing the cast without disturbance to apposition it is not advisable to repeat the treatment every day, unless serious disturbance of circulation or general debility makes treatment every day imperative. Under ordinary conditions every second or third day will suffice at first.

After ossification has commenced and the fragments are fairly well united the seat of the fracture can be worked upon and passive movement of the ankle and knee may be commenced, at first in a limited range of the normal movement, gradually extending the same to full normal movement. Centripetal strokings may

also be used about this time if there is no abrasion of the cuticle. If the continuity of the skin is interrupted, all antiseptic precautions must be observed, and the affected area covered by gauze saturated with an antiseptic solution, through which the manipulations are performed.

As soon as the union is solid, the massage should be given every day and more stimulating manipulations may be used, as kneading and rolling of the muscles and if required, friction over solid infiltrations or existing adhesion or newly formed abnormal tissues. Now is the time for the active movements—at first *without,* later *with,* resistance—to obtain and improve muscular control and strength. As soon as the patient has sufficient strength and control of his muscles he should be induced to walk in such a manner as to bring into normal action all the muscles, and if necessary special exercises for this purpose should be given.

In conclusion, when the distribution of the nutrients are in this way taken care of we should see that we have *something* to distribute, in other words, the blood should be enriched by nutritious stimulating food sufficient in quantity for the individual. This is best regulated by consulting the habits and taste of the patient and based on this, issue a special diet list.

The average hospital diet is more suitable for fever patients and dyspeptics than for, as in most cases, vigorous individuals requiring

an additional supply of reconstructive material and it is my belief that if sufficient food is taken and properly assimilated we will be less dependent on special medication; but either is inadequate if not supported by a good circulation.

70 STATE STREET.

DEMONSTRATION.

In alighting from a street car this patient suffered a fracture of the tibia. The fracture was located in such a way that the nutrient foramen was involved. (I am able to show this case and the one following through the courtesy of Dr. Plummer.) After 7 weeks the doctor took off the cast and found no union at all, the fracture was practically fresh, and in consultation it was decided that massage should be tried. When I first saw the patient there was a history of a large blood clot at the time of the fracture. The family history is negative, the lady herself in perfectly good health. I hesitated very much before undertaking this case, because in itself it was almost too complicated for massage. There was danger of producing an embolus at any time, but as it was I considered the nutrient artery was obstructed to such an extent that if nothing was done the leg would have to come off. I accordingly started in with massage, taking proper care as much as possible not to dislodge an embolus, and succeeded. I began 7 weeks after the cast was first set, February 18. In February I gave 10 treatments; in March 5 treatments, when the bone was practically solid; in April 2 treat-

ments, and 2 later on, merely to accustom the muscles to the control of the will. The fracture healed under this treatment perfectly, and if any of you would like to see the site of fracture the patient is willing to exhibit it to you. (Patient exhibits fracture.) It does not show much of the fracture; sometimes in the evening there is a little edema, but very slight.

(The next patient, a young man, is shown.)

I will demonstrate as well as I can the methods of massage in cases of fracture in all the different stages of treatment, explaining the movements. (Patient lies down on table.) This cast was just taken off. On July 11 this young man was in a railroad collision, fracturing the tibia and the fibula near the ankle. I was called and gave the first treatment of massage on August 3. When the cast was taken off there was not a semblance of union; there was the same crepitation you would find in a perfectly fresh fracture. The history is positively specific, which explains it. During August I gave 10 treatments of massage; during September 7 treatments, and during October 9 treatments—26 treatments—and just during the last week the union has become a little more than semi-solid.

In the first place, when I treat a fresh fracture, I stimulate the muscles before taking off the cast, the object being to stimulate the circulation. I do this before removing the cast. After this I move the hip-joint, for the purpose of stimulating the circulation in the hip-

joint. We will consider this a fresh fracture, without any union at all.

Q. Do you mean immediately after the fracture?

Dr. Engelbrectson: No, immediately after the fracture I would never give massage, but you will find very little difference in the bone 8 to 14 days after the fracture. There is a little agglutination of the segments in ordinary cases, and if there be any danger of complication in the joints we ought to start that early. So we will consider this fracture an ordinary fracture, with complications to be feared in the joint, say two or three weeks old. (Removing dressings.) In taking such a fracture as this out of the cast we will have to exercise great care. In the first place we will have to be ready to place the limb in such a way after the cast is off that there will be no bearing on any of the fragments, the fragments lying perfectly easy. We must lift it in such a way as not to disturb the apposition at all. That is very hard if not impossible to do without assistance.

The first thing we do is to place the hand over the fracture. This is to prevent any movement. In this case I was unable to do it. The first week I found slight crepitation in the fracture, no matter how careful I was. All I do in the first stage is to compress and relax the muscles with the fingers closed, at first very superficially, gradually as I can do so without disturbing the limb and without any force I go deeper, as deep as I possibly can without dis-

turbing the apposition. I work this way all through the muscles, keeping it up until I get stimulating reaction which I notice by a slight increase of tenderness and a slight perspiration. After I get the tissues as elastic as possible, reducing the edema, I put the limb back into the cast. In that way I keep on treating it. The treatment lasts about 15 minutes, sometimes longer. For the first week I do not go near the fracture—I merely keep my hand there to prevent any movement. This I repeat, sometimes every day, sometimes every second or third day, depending upon the general condition of the patient.

Now we will consider that we are over the first stage. As soon as we get a semi-solid union we can proceed to the second stage of the treatment, when we can knead the muscles. I still watch the fracture, taking care that there is no movement. I go deeper and knead the muscles just as I would roll a ball between the fingers and thumb. In getting the hand under I do not lift the limb much, but press the hand down. I do not rub on the bones. I see that every part of the muscle tissue is reached and reduce as far as possible any edema or infiltration that exists. This treatment is given every second, third or fourth day.

After the fracture is a little more solid, but still not entirely so, I start with movements of the joints. This varies in different individuals; sometimes three weeks after the cast is first put on, sometimes earlier, sometimes later, I start

movements of the joints, watching all the time the fracture. I can also at this time give effleurage, or strokings, not disturbing the apposition. After that (we are still at a stage when the fracture is semi-solid) I move the ankle joint; fixing the lower end of the tibia and fibula, I rotate the ankle first in one direction and then in the other, then extension and flexion. Then I move the toes, fixing the tarsus, back and forth, then extend and flex them. After this I work through on the dorsal and plantar surfaces of the foot, reducing the edema here. In cases like this, where the skin is broken, I use a piece of gauze saturated in an antiseptic solution, wrap it around, and manipulate through this. I do not go near the fracture until the second stage, when there is semi-solid union. Then I go down over the seat of the fracture. There is a good deal of edema here which is due to the dependent position of the leg without use of the muscles. (In my paper this point is fully considered.) This is, of course, an unusually long time for a case to be treated, which can only be explained by the specific history.

Q. Was there any union there at the time you first saw it?

Dr. Engelbrectson: On August 3 there was no union at all; now the union is nearly solid, but the callus is very slight. I avoid irritation or pain as much as I can.

Q. Was he taking any treatment or inunctions before you began your treatment?

Dr. Engelbrectson: I was not giving the medical treatment.

It is almost too early in this case to illustrate the movements necessary to get control of the muscles, but the fracture is sufficiently solid for me to show you what I do in the finishing stage.

In the last stage, after the fracture is perfectly solid, I start with active movements. I first let the patient move it himself without assistance, then later on I offer sufficient resistance so that the patient can barely do the movement I ask him to do. In this case it is a little too early to start this treatment. Then I go through the movements of the ankle and knee in the same way, finally offering resistance to voluntary movement.

After the fracture is solid enough, I give the patient such exercise in walking as compels him to use every muscle. Walking in which the leg is simply a pendant member does not do any good. I insist that the patient shall walk in such manner as to use the muscles, and sometimes two or three exercises given for the purpose will prevent six months of limping.

Q. Was that a compound comminuted fracture?

Dr. Engelbrectson: No, it was not compound, the fragments were inside. These scratches were simultaneous with, but not from the fracture.

Q. Have you ever used Bier's compression in these cases?

Dr. Engelbrectson: Not in fractures. In the consideration of the treatment of joints I covered that point in my paper.

Q. Can one not get pretty good massage from the use of an ordinary vibrator?

Dr. Engelbrectson: You can in some cases, but you cannot direct it to any certain point, you cannot confine it to any certain point; you are liable to get stimulation where you do not want it, and it is impossible to get the kind of stimulation you want in certain parts. In the case of healthy tissues, where stimulation is needed the vibrator is all right.